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In 1965 the Joint Chiefs of Staff tasked the Air Force to develop a joint airspace control doctrine. The Services could not agree on the contents of the draft manuals prepared by the Air Force. This study analyzed the issues which prevented service agreement, reviewed the recommendations of other researchers, and then proposed and tested a conceptual solution to the inter-service problem. A concept of nine airspace control modes was presented to select officers from the U.S. Army Command and General Staff College and the Combined Arms Combat Developments Activity (CACDA). The nine modes as presented were not determined to be acceptable for joint doctrine; however 35 of the 48 officers who participated in the test indicated that three or more modes of operation should be used for joint airspace control.

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A PROPOSAL FOR A MULTIMODE JOINT
AIRSPACE CONTROL DOCTRINE

A thesis presented to the Faculty of the U.S. Army
Command and General Staff College in partial
fulfillment of the requirements of the
degree

MASTER OF MILITARY ART AND SCIENCE

by

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The opinions and conclusions expressed herein are those of the individual student author and do not necessarily represent the views of either the U.S. Army Command and General Staff College or any other governmental agency. (References to this study should include the foregoing statement.)

ABSTRACT

In 1965, the Joint Chiefs of Staff tasked the Air Force, in coordination with the other Services, to develop a joint airspace control doctrine. The Services subsequently could not agree on the contents of draft manuals prepared by the Air Force. This study analyzed the issues which prevented Service agreement, reviewed the recommendations of other researchers, and then proposed and tested a conceptual solution to the inter-Service problem. The study noted that the Air Force tried to combine command relationships, general principles for airspace control, and specific procedures into one manual, which gave each of the other Services the opportunity to take exception to a specific tactical or command situation as a basis for rejection. The author proposed a solution based on the premise: different tactical situations require different procedures for airspace control; therefore, a joint airspace control doctrinal manual should recognize identifiable groupings of procedures, or modes, of airspace control. A concept of nine airspace control modes was presented to selected officers from the U.S. Army Command and General Staff College and the Combined Arms Combat Developments Activity at Fort Leavenworth, Kansas. The nine modes, as presented, were not determined to be acceptable for joint doctrine; however, 35 of the 48 officers who participated in the test indicated that three or more modes of operation should be used for joint airspace control.

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CHAPTER I

INTRODUCTION TO THE JOINT AIRSPACE

CONTROL PROBLEM

OBJECTIVE

The objective of this study was to investigate a United States military doctrinal problem on joint airspace control and propose a conceptual solution. The following topic was found in an Air University Compendium of Research

Topics:

In 1965, JCS tasked the Air Force, in coordination with the other Services, to develop joint airspace control doctrine. Since then the Air Force has been unable to obtain coordination on six separate drafts of the proposed joint doctrine. A study is needed to examine the divergent Service positions and recommend possible solutions to resolve this interservice position.¹

This is a current and significant problem that affects the Armed Forces of the United States when two or more Services are acting together as part of a unified command or a joint task force. Unless the guidance for training and preparation of each separate Service is compatible, or at least understood by the other Services, operations under a unified commander may require detailed replanning or additional training to reduce conflicts in airspace control procedures. This study will identify the divergent Service positions on joint airspace control doctrine, recommend a conceptual

solution, and then test the solution.

TERMINOLOGY AND ABBREVIATIONS

Since airspace control procedures at the joint Service level will be studied, the terms used in this study will be from the Department of Defense Dictionary of Military and Associated Terms.² Terms which are not commonly used in military publications will be explained in the text of this study.

LIMITATIONS OF THE STUDY

This study was limited by the reference material available at the U.S. Army Command and General Staff College and correspondence made available to the author from the Combined Arms Combat Developments Activity, Fort Leavenworth, Kansas. Secondary sources were used to obtain unclassified excerpts from documents and correspondence which had overall security classifications or controlled dissemination. Requests made by the U.S. Command and General Staff College Library to acquire relevant Joint Chiefs of Staff Decision Memorandums for this study were not approved. While much helpful information on joint airspace control issues was received through personal interviews and telephone conversations with officers familiar with the subject, some of the useful information was volunteered only on a nonattributable basis. During this study, inter-Service negotiations on the

airspace control issues continued. This caused available information and verbally stated negotiating positions to change as negotiations progressed; therefore, only official documents and correspondence were used as reference material in this study.

DEFINITION OF JOINT AIRSPACE

CONTROL DOCTRINE

The Department of Defense Dictionary of Military and Associated Terms does not define airspace control. The definitions of the words "airspace," "control," and "doctrine" can be put together to form various connotations ranging from "principles for air power" to "avoiding collisions in the sky." In 1965, the Joint Chiefs of Staff defined airspace control:

Airspace control consists of the coordination, integration, and regulation of the use of airspace of defined dimensions. In this context, coordination is that degree of authority necessary to achieve effective, efficient, and flexible use of airspace without providing command authority. Integration considers the necessity to consolidate requirements for the use of this airspace in the interests of achieving a common objective at the lowest possible level of effort. Regulation indicates the requirement to supervise activities in this airspace to provide for flight safety to insure such safety. Airspace control, therefore, denotes a service provided in order to permit flexibility of actions; while authority to approve, disapprove, or deny is vested only in the joint commander.³

The above Joint Chiefs of Staff definition of airspace control was repeated in an abbreviated form in many Service manuals.

The Department of Defense Dictionary of Military and

Associated Terms defined doctrine as:

. . . fundamental principles by which the military forces or elements thereof guide their actions in support of national objectives. It is authoritative but requires judgment in application.⁴

In this study, these two definitions were used to stress that a decision process is required for the application of joint airspace control doctrine. It should be noted that the Joint Chiefs of Staff interpreted airspace control as only a service to be provided for a joint force commander and that only the joint force commander was given authority for airspace control.

METHODOLOGY

This will be a three phase study to investigate the historical background of the joint airspace control conflict, review the efforts of other researchers, and then propose and test a solution. From the reference material available at Fort Leavenworth, relevant excerpts from official correspondence will be presented to illustrate historical background and the problems associated with the lack of an agreed upon doctrine. The next phase will analyze the efforts of other researchers. Primary emphasis will be placed on published research reports from the Air War College. The senior rank and career experience of the students at the Air War College should result in research reports which are applicable to joint Service operations. After analyzing

the recommendations of other researchers, the last phase of this study will develop and test a solution which does not simply repeat the efforts of others. One goal of the test will be to obtain the opinions of officers who are familiar with joint airspace control. The test should show not only the acceptability of a proposed solution, but offer participating officers the opportunity to submit their comments and discuss joint airspace control problems with the author.

BACKGROUND

Continuing disagreement between the Services on the issues of airspace control prompted the Joint Chiefs of Staff to study the problem in 1965. A paper was staffed to examine alternatives, resolve the divergent positions of the Services, and produce a joint airspace control doctrinal manual in the form of a JCS Publication. The Joint Chiefs of Staff stated:

. . . analysis disclosed that the basic divergent issue among the Services is the degree and manner of control of airspace over the combat zone. It appears that in order to obtain the maximum cohesiveness of combat forces and the maximum degree of compatibility in tactical command and control systems now under development by each Service, it is necessary to resolve this divergent issue.

The Joint Chiefs of Staff produced a decision paper titled: "Divergent Issues Affecting the Development of Tactical Command and Control Systems" on 10 May 1965. The short title "JCS 2308/299-2" will be used to identify this decision paper in the remainder of this study. From a

briefing presented to the Chief of Staff of the Army, the key points of this decision paper were stated as:

A definition of airspace control.

Make maximum use of Service control systems.

Regulate air traffic to preclude interference.

Recognize the requirements of each Service.

Assignment of Block Airspace.

Degree of Authority.

Maximum freedom principle.⁶

JCS 2308/299-2 approved two of seven alternative solutions, one of which applied only to amphibious operations, while the second pertained to airspace control in combat areas outside of the amphibious objective area.⁷ The publication of the four Service manual, Doctrine for Amphibious Operations, completed the action required for airspace control in the amphibious objective area. The manual repeated the Joint Chiefs of Staff's definition of airspace control and acknowledged complete authority for airspace control by the amphibious task force commander. The control of airspace in an amphibious objective area also set a precedent for "block airspace" assignment which became a major issue in airspace control for other combat operations.

On 17 May 1965, the JCS Memorandum SM-442-65 tasked the Air Force, in coordination with the other Services, to develop a joint airspace control doctrine for operations in a combat area, excluding amphibious operations. The required

doctrine was to be developed in accordance with the guidance in JCS 2308/299-2 and Unified Action Armed Forces, JCS Publication 2.⁸ In the tasking, the Air Force was to consider the following fundamental requirements:

The primary objective of controlling airspace is to maximize the effectiveness of combat operations.

Each Service component within a joint force has requirements to operate aerial vehicles or weapons systems within the airspace over the combat zone in the performance of its assigned mission.

The commander of a joint force must have the capability to assure that friendly operations requiring the use of airspace can be accomplished without placing undue restrictions on any component command and with the least adverse impact on the capabilities of these commands. If restrictions are imposed, they should be of a temporary nature only and for a specific purpose or reason which justifies the necessity for such restrictions.

Without degrading overall responsiveness to "airspace control," the system should be operated to recognize and provide for the requirements of all components to operate under the joint force commander (i.e., aerial vehicles, surface-to-surface tactical missiles, surface-to-air missiles, artillery, gunfire, and mortar projectiles).⁹

Attempting to accomplish the task, the Air Force prepared a draft manual of a proposed JCS Publication titled "Doctrine and Procedures for Airspace Control over the Combat Area" and sent the draft to the other Services for concurrence during September 1965. The Army, Navy, and Marine Corps did not concur and recommended changes. Six drafts of the proposed manual, dated September 1965, September 1966, April 1967, March 1968, January 1969, and March 1971, were sent to the three Services and subsequently were returned with

recommended changes which were unacceptable to the Air Force. The Air Force transmittal letter for the 1968 draft expresses the frustration and level of negotiations:

In order to reactivate the project, another draft manual (attached) has been prepared in an attempt to overcome the cited weaknesses while at the same time reflecting, insofar as possible, the results of action officer negotiations. The draft manual is intended as a point of departure for a new attack on the problem of airspace control over the combat zone with a view toward resolving as many divergencies as possible and definitely identifying those that remain. It is emphasized that the new draft manual is not necessarily the text the Air Force would desire, so that Air Force proposed changes can be expected in subsequent action officer meetings. . . . protracted negotiations are not planned. If full agreement cannot be reached, remaining divergencies will be clearly identified in the package forwarded to the JCS.¹⁰

At the time the Army reviewed the March 1971 draft of "Doctrine and Procedures for Airspace Control over the Combat Area," the following Army position, approved by the Vice Chief of Staff, was in effect:

An airspace control system must be devised which maximizes all combat operations, prevents mutual interference and provides all Services having weapon systems and using airspace with the maximum flexibility consistent with safety.

The land component commander habitually requires freedom of use without positive control of the airspace immediately over the field army area for maximum flexibility to employ organic aircraft and weapons whenever land forces are committed to combat.

Unless there are overriding tactical considerations, the operation of Army aircraft within the combat zone must be free of constraints. Only in the most severe situations should positive control by any Service be considered.

The extent of airspace required by the land component commander to employ organic aircraft and weapons would

be dictated by the situation and would vary from time to time and theater to theater.¹¹

The Army position stressed the requirement to employ Army aviation and organic weapons without the constraints of positive control by another Service. This position can be contrasted with the Air Force desires for a centralized airspace control system to be managed by the Air Force Component Commander during joint operations. The March 1971 draft of the proposed manual had the following Air Force principles for airspace control:

An airspace control system, coordinated, integrated and regulated by a single authority responsive to the Joint Force Commander, is essential to safe and orderly air operations.

Airspace control and air defense procedures must be compatible and mutually supporting.

Airspace control facilities employed by the Service components in the combat area must be compatible with each other and with air defense control and coordination systems.

Flexible force employment demands fully flexible airspace arrangements. Therefore, airspace restrictions on the use of aerial vehicles or weapons systems must be limited to those necessary to insure flight safety, prevent mutual interference and facilitate air defense. Such restrictions as are imposed should be temporary.

Close liaison and coordination between all components must be established to insure mutual understanding and an unimpeded flow of essential information concerning the use of airspace.

Complete, reliable, and compatible communications networks with sufficient priority to insure uninterrupted services are indispensable to the successful functioning of the airspace control system.

Maximum use should be made of radar or other electronic means for identification and control.¹²

In response to the above Air Force principles for airspace control, the Army noted the Air Force draft had used different wording in the first principle from the Joint Chiefs of Staff's guidance and recommended:

Change to read: "An airspace control system responsive to the Joint Force commander and to the requirements of the individual components, coordinated, integrated and regulated by a designated authority is essential to safe and orderly operations."

Reason: Compliance with JCS 2308/299-2.¹³

The second principle that stated airspace control and air defense must be compatible was amplified by the Army to include fire support considerations:

Change to read: "Air traffic, air defense, and fire support procedures and facilities must be compatible . . ."

Reason: To establish the requirement for mutually supporting procedures and facilities among the primary airspace users.¹⁴

The Army recommended 36 changes to the March 1971 draft, ten of which the Air Staff considered substantive.¹⁵ The Army referenced JCS 2308/299-2 five times in the recommended changes to support Army requirement for "block airspace" and to encourage the Air Force to make certain paragraphs of the draft manual "exact quotes of JCS 2308/299-2." The Army summarized the reasons for rejecting the 1971 draft with the following statement:

Although the fundamental considerations and basic principles are consistent with those expressed in JCS 2308/299-2, the actual procedures proposed in the latest draft manual reflect considerations which were rejected by the JCS in May 1965 . . . The concept does not fully recognize and accommodate the land force

commander's requirement to employ organic aircraft and weapons as the tactical situation dictates.¹⁶

The Navy recommended ten changes to the 1971 draft manual, which primarily stressed equipment compatibility, the requirement for airspace control at the task force level instead of the unified command level, and the possibility of a Navy or Marine Corps component commander being designated as an airspace control coordinator. In one place in the draft manual, the Air Force omitted a "normally" and stated that the Joint Force commander "will" designate the Air Force Component Commander as the Area Airspace Control Authority. This was noticed and a recommended change was made for the following reason:

To conform to the tasking directive (JCS 2309/299-2). To place responsibilities and authorities of the Area Airspace Control Authority into the proper perspective and to provide for all contingency situations. The draft wording does not accommodate situations wherein force composition and employment will dictate designation of the appropriate component commander as Area Airspace Control Authority, nor does the draft wording permit determination by the Joint Force Commander of the need for such a coordinating authority.¹⁷

The Navy stated that the Area Airspace Control Authority should coordinate "requirements" instead of "requests" for the use of airspace. They recommended a change for the following reason:

Commanders will inform the Airspace Control Authority of requirements; they will not make requests or seek adjudication by the Authority. Accordingly, there should be little opportunity for disagreement although conflicts in requirements may emerge which would require resolution by the Joint Force Commander.¹⁸

The Marine Corps also recommended changes to the 1971 draft manual. The Marine Corps stated they would concur with the doctrinal manual if twenty-one changes were made. The recommended changes stressed tactical flexibility for ground commanders and acknowledged that the Air Force component commander might not always be the Area Airspace Control Authority during joint operations. The reasons for the recommended changes included:

In a combat area friendly troops frequently make unexpected contact with enemy forces. In such situations artillery must immediately be employed. The need for such fire missions is a fundamental consideration which must be provided for in the proposed doctrine.¹⁹

Marine and Army units may comprise the Joint Force with the Marine Corps providing most, if not all, of the tactical aviation assets. In such a case these Marine aviation assets would include elements of the Marine Air Command and Control System (MACCS) which would constitute the nucleus of a Joint Force Airspace Control System. Under these circumstances the senior Marine aviation component commander should be designated the Area Airspace Control Authority.²⁰

In its efforts to provide an efficient and centralized airspace control system for the unified commander, the Air Force was confronted with an array of tactical and command exceptions. The exceptions stressed autonomous operation of Service components at lower command levels and the requirement of ground commanders to employ organic air defense and artillery weapon systems. The Tactical Air Command observed:

Lack of agreement has hinged primarily on the following two points: (1) Navy insistence that airspace control will be exercised at the joint force level vice the unified command level; and (2) the Army/Marine stand on a permanent block of airspace over the field army tactical area of operations.²¹

Since 1971, many informal proposals and counter proposals of airspace control draft manuals have been initiated by the Services. The content and Service positions are basically the same, but the titles have been changing. Working drafts for "airspace coordination," "airspace service," and "airspace management" have been circulated in attempts to satisfy the JCS 2308/299-2 tasking for joint airspace control doctrine.

While informal action officer negotiations continue in an attempt to satisfy the Joint Chiefs of Staff's tasking for a joint airspace control doctrinal manual, on 18 December 1973 the Army and the Air Force agreed to try to develop a two Service airspace control manual. If these two Services can agree on an airspace control doctrinal manual, a precedent would be set to encourage Navy and Marine Corps participation to develop a four Service manual. The immediate goal was not a JCS Publication, but a manual that would be endorsed by each Service, as was Doctrine for Amphibious Operations. The Air Force Tactical Air Command and Army Training and Doctrine Command formed an ad hoc working group to resolve the procedural issues on airspace management, the currently accepted term for airspace control. The tasking of the ad hoc working group redefined the objectives of airspace control as airspace management:

Airspace management is defined as those concepts, procedures and actions required to insure the highest possible degree of coordinated and integrated use of the airspace by all users which will provide:

- a. Maximum flexibility in operations.
- b. Minimum time in response to user requirements.
- c. Minimum risk to manned air operations.
- d. Maximum capability to defeat enemy air.²²

An agreement on the procedures for airspace management will still require resolution of airspace assignment over a combat zone and resolution of the command and control responsibilities for airspace control. This will require Service cooperation which has not been evident on these issues.

AIRSPACE CONTROL ISSUES

While the Air Force maintains that a joint force commander should designate the Air Force Component Commander as both an air defense commander and an airspace control authority, the Army is cautious about relinquishing any authority. The Air Force maintains that a single manager, acting for the joint force commander, will provide the most efficient and flexible use of airspace. This would allow the Air Force Component Commander to employ centralized direction of not only his own assets, but also the airspace control facilities of other Services in the joint force. General Maxwell D. Taylor expressed a skeptical attitude in 1959:

Since 1947, the Army has been dependent upon the Air Force for tactical air support, tactical airlift and for long-range air transport. Throughout this period, the Army has not fully discharged its obligations undertaken at the time of unification. The Air Force having something which the Army wanted has been in a position to put a price upon cooperation

and to insist upon acquiescence in Air Force views on such controversial issues as air-ground support procedures, air resupply, and control of airspace over the battlefield.²³

The Army would favor a supported and supporting relationship more along the lines of the JCS guidance for close support:

When a force is assigned the primary mission of close support of a designated force, the commander of the supported force will exercise general direction of the supporting effort within the limits permitted by accepted tactical practices of the Service of the supporting force.²⁴

The entangled airspace control issues at the joint level have prompted the Army to propose its own airspace control systems. One Army concept was similar to the Air Force's desire for integrated air defense and airspace control system, except it would have an Army manager. Some airspace control problems and a proposed integrated system was discussed in the March 1972 issue of Air Defense Trends:

Present doctrine lacks cohesion, and procedures for control and coordination of airspace users are restrictive and impact adversely on operations of the ground force commander. Army doctrinal manuals normally reflect airspace control or coordination from a proponent's point of view and fail to consider all airspace users and how they interact with each other. The lack of agreed upon joint doctrine between the Army and Air Force apparently is the reason given for the Army's procrastination to attempt to solve its airspace coordination problem. General Palmer, the Army Vice Chief of Staff, stated at the 1971 Air Defense System Program Review: 'I think we are on the right track on that one: tying airspace control to air defense; air traffic management to fire support coordination-all of that together. Well, gentlemen, we have got to get our own house in order if we are going to get anywhere with getting joint agreements with the Air Force'.²⁵

The Navy and Marine Corps have also been developing their own airspace control procedures in the absence of an

agreed joint doctrine. The Chief of Naval Operations and the Commandant of the Marine Corps signed a joint letter stating:

. . . lack of joint doctrine over the remainder of the combat zone has resulted in confusion, inefficient employment of resources and other inconsistencies in the development of air operations for critical military operations.²⁶

They stress that commanders of joint forces should exercise airspace control through each of the individual Service component commanders instead of a centralized system tasking individual air control facilities. This appears to be rejecting the Air Force single manager concept. While the airspace control issue remains unsolved, each of the Services tend to jealously protect their responsibilities assigned by "Functions of the Armed Forces and the Joint Chiefs of Staff."²⁷

CHAPTER II

REVIEW OF RELATED LITERATURE

GENERAL

Very little literature suggesting balanced solutions to the divergent service positions on joint airspace control was found at the U.S. Army Command and General Staff College Library. The abstracts of research reports from the military colleges and universities disclosed that few researchers attempted to find a solution other than further optimizing one aspect of the air control system. Of 1,144 papers in the 1972 Air University Abstracts of Research Reports, only that of Lieutenant Colonel Melvin H. Sautter, USMC, addressed the doctrinal problem.²⁸ Four other 1972 studies concerning airspace control were equipment oriented and not useful. In the 1973 issue of the abstract, two research teams led by Colonel Robert I. Stoverink, USA, and Lieutenant Colonel Jim Fults, USAF, addressed the doctrinal problem and attempted to amplify the work of Sautter.²⁹ Other published sources, including the Rand Abstracts, U.S. Government Research and Development Reports Index, Defense Documentation Center Index, Government Reports Announcements, and cataloged research reports at the U.S. Army Command and General Staff College Library, failed to indicate relevant material on

the doctrinal issues of joint airspace control. Current periodicals such as Aviation Week and Space Technology and the Armed Forces Journal also did not address the doctrinal aspects, but were concerned with the research and development of equipment. The Reader's Guide and The Air University Guide to Periodic Literature were equally unproductive for this study.

RESEARCH OF SAUTTER

As an Air War College student in 1972, Lieutenant Colonel Melvin H. Sautter, USMC, wrote a research report titled "Principles for the Control of Air Support Assets Over Joint Land Combat Operations." He referenced his own experiences as the Air Operations Officer, G3 Section, Headquarters, Fleet Marine Forces, Pacific from 1967 to 1970 to add personal insight into the joint airspace control conflict. He discussed the impact of the reorganization of the Armed Forces in 1947 and the subsequent conflicts over roles and missions. A chronology of other Service conflicts, including the functions of, close air support, air transports, and the rightful ownership of helicopters was developed to set the environment for the airspace control dilemma. Sautter established that the control of airspace over joint land combat operations was a continuing source of Service conflict that remained unsolved. Noting that there is a valid requirement for joint airspace control doctrine, he

stated there was adequate guidance in current Joint Chiefs of Staff Publications, joint doctrinal manuals, and Joint Chiefs of Staff Decision Paper 2308/299-2 to develop the required joint airspace control doctrine. His recommendations stressed service cooperation, the use of airspace "coordination" instead of "control," and the designation of the unified commander as the coordinating authority. Sautter stated the principles to be considered could be expressed in one compendium:

The objective of airspace coordination is to provide a service for the unified commander that would coordinate, integrate, and regulate the entire fire support effort over the combat area: a consumer-oriented service which would be responsive to the operational requirements of all component commanders utilizing airspace in support of the unified commander's mission.³⁰

Sautter repeated the basic Joint Chiefs of Staff's guidance and urged cooperation that has not existed to solve the problem. The Services' replies to the March 1971 draft manual were not available to Sautter, but he noted that, while the latest draft:

. . . establishes the air component commander as the single authority for providing airspace control service, it does not integrate the airspace control capabilities of the other Services into a unified airspace control system.³¹

He was doubtful the latest draft would meet with anymore success than the previous five drafts. Sautter stated:

Accordingly, it is anticipated that the Air Force will either delay or simply refrain from submitting the draft to the JCS until the divergencies are resolved to the Air Force's satisfaction; contending that the absence of joint doctrine is preferable to doctrine which might unduly caveat the Air Force component commander's authority.³²

Sautter's prediction was correct, the 1971 draft was rejected, and informal negotiations have taken place since then.

RESEARCH OF STOVERINK

The stated purpose of a study by Colonel Robert I. Stoverink, USA, Colonel Charles M. Summers, USAF, and Lieutenant Colonel Charles W. Henry, Jr., USMC, was to amplify the study made by Sautter in 1972. As a Lieutenant Colonel, Stoverink was an action officer on the Department of the Army staff and participated in the Army's position on the Air Force draft manual of "Joint Doctrine and Procedures for Airspace Control in the Combat Area," dated March 1971. The study presented a listing of airspace users and the current airspace control procedures of each of the four Services. In their conclusions, they recognized the need for a joint force or unified commander to have one airspace control authority, but also recommended maximum utilization of all Service facilities and the use of decentralized control of airspace. They said decentralized control was necessary because no present system is sufficiently responsive to all the demands of airspace users. They recommended an integrated control doctrine using a Joint Airspace Control Center with representatives from all the Services, primarily for planning and coordinating. The airspace control authority would be delegated to sectors, with joint sector airspace control centers. Maximum use of all service

facilities and capabilities would be coordinated by these joint centers.

RESEARCH OF FULTS

In a professional study at the Air War College, Lieutenant Colonel Jim Fults, USAF, Lieutenant Colonel Lawrence N. Parker, Jr., USAF, and Lieutenant Colonel Gene B. Reniker, USA, analyzed the competition between airspace users in a combat area and proposed a solution. They proposed the Air Force component commander of a joint force operate a Joint Air and Airspace Coordination center with a large central computer, and that all the airspace users have data entry devices. In a management by exception scheme, the data from aircraft, artillery, and other airspace users would be entered into the computer, which would signal conflicts. They pointed out that if there were no airspace user conflicts, no action would be required. Any conflict detected by the computer would signal the users to coordinate. The concept would require extensive automatic data equipment, reliable communications systems, and precision navigation and plotting by all airspace users to be effective.

Noting that JCS Memorandum 2308/299-2 was not available at the Air University Library, they made their analysis of Joint Chiefs of Staff's guidance based on a briefing by Colonel Stoverink. The team concluded that the guidance from the Joint Chiefs of Staff was more accommodating than

pragmatic. They took exception to the compromise solution which they claimed only recognized that a problem existed. Their proposal was based on the following principles:

The objective of airspace management is to achieve maximum effectiveness in combat operations.

The unified commander is the owner of airspace and is responsible for its effective management.

No service or service component has a proprietary right to the unified command's airspace.

Every service has requirements for airspace and these requirements must be recognized.

Every legitimate airspace user should have the freedom to use airspace when, where, and in the manner necessary.

All airspace users are mutually obligated to share timely and complete information concerning airspace use.

The right to use airspace in the act of self-defense.³³

Fult's principles for airspace control were similar to the basic Joint Chiefs of Staff's guidance, which he believed were too accommodating.

OBSERVATIONS

The Air War College research reports by Sautter and Stoverink were the most useful for this study. They presented balanced historical influences, but in their conclusions could only appeal for increased Service cooperation to resolve the problems. Other research reports tended to focus on one aspect of the joint airspace control problem and recommend solutions which optimized only one aspect of the system, usually at the expense of another airspace user.

The reviewed Service manuals naturally expressed the requirements and need for centralized control of a Service's own assets. The Air Force manuals stressed the responsibilities of the Air Force component commander to exercise centralized management of airspace control as an integral part of tactical air operations and air defense. Close coordination with other airspace users, such as artillery and helicopters, was directed; however, the emphasis was placed on the Air Force component commander's responsibility to evaluate airspace control problems on a case by case basis. Army manuals such as Army Airspace Coordination Doctrine, FM 44-10 (Test) were based on Army studies which emphasized the requirement for field commanders to control a block of airspace. While the Army manuals recognized the overall authority of the Air Force component commander to control airspace, they stressed a requirement for the Army commander to be delegated authority to control a designated block of airspace in the combat area.

CHAPTER III

A PROPOSED AIRSPACE CONTROL CONCEPT

ASSUMPTION

If the lack of agreement between the Services on joint airspace control is only a symptom of other inter-Service conflicts, the solution is political and beyond the scope of this proposal. It will be assumed, for the purpose of this proposal, that a solution to the Service divergent issues on joint airspace control doctrine can be based on pragmatic tactical and command considerations.

BACKGROUND

The Air Force drafts of the proposed manual "Doctrine and Procedures for Airspace Control over the Combat Area" and the counter-proposals by the other Services contain a sufficient number of principles and procedures to effect an airspace control system. The Service manuals also contain sufficient procedures for the control of each weapon system. The basic problem is combining all the valid requirements and tactics of each weapon system into a workable airspace control system. The abundance of principles and procedures, sometimes redundant and sometimes conflicting, must be arranged in functional groupings of complementary procedures. In the author's opinion, a common

reason for rejecting an airspace control procedure proposed by one Service has been that another Service could identify a tactical situation where the same procedure would be inappropriate. This is one of the sources of the divergent service positions.

The second source of conflict is the degree of participation each commander has in the decision process for utilizing airspace in joint operations. There is a propensity for ground commanders to not relinquish control of airspace if regaining control will be a difficult procedure. A process is needed for component commanders to make their actual requirements known to the joint force commander for an effective decision process.

CONCEPT OF THE PROPOSAL

To be acceptable as joint airspace control doctrine, a proposed solution should be tactically sound, satisfy the requirements of the 1965 Joint Chiefs of Staff guidance, and be compatible with the doctrines of the four Services. To be tactically sound, the solution must be applicable to a wide range of battlefield situations. Instead of attempting to accommodate all tactical situations by generalizing the principles and procedures, groupings of currently used procedures will be developed. The 1965 guidance given by the Joint Chiefs of Staff included the provision for assigning blocks of airspace to airspace users. In this proposal,

blocks of airspace will be used to encompass compatible airspace users and exclude airspace users which could precipitate unacceptable conflicts. As discussed earlier, the doctrinal manuals of each of the Services contain sufficient numbers of principles and procedures to develop a joint airspace control doctrine. By applying these existing principles and procedures to appropriate tactical situations, the requirement for compatibility to existing Service doctrine will be considered as satisfied. This may seem as an exception; however, doctrine requires judgment in application, and a knowledgeable commander would reject inappropriate procedures even if the procedures were doctrinally accepted in a Service manual.

Compatible groupings of procedures will be put together for use in blocks of airspace. These groupings will be defined as modes of airspace control. The purpose of the modes will be to provide a common terminology for commanders for an airspace control decision process. By using descriptive titles, which could be replaced by code numbers, commanders participating in airspace control decisions will have a common reference. Ideally, the titles should form the same mental images in the mind of each commander. Other military operations have descriptive titles. Examples are the terms pursuit, defend, screen, or attack which should form a mental image of what should be done and the characteristics of the required operation. While the modes

of airspace control will not have a direct correspondence to these terms for ground or air operations, the airspace control modes should give an indication of relative enemy threat and the actions required to meet the threat. With common terminology for groupings of procedures to be used in a block of airspace, participating commanders should have the vocabulary to communicate their requirements to each other. If ground and air component commanders can accurately relate their requirements in common terms, they should be able to reach agreements or forward a disagreement to a senior commander in standardized terms.

DEVELOPMENT OF THE MODES

The two major factors which will influence the development of the airspace control modes will be the enemy threat and the assets used to meet the enemy threat. Other considerations could be included; however, threat and capability have direct tactical application and produce a reasonable number of modes. Three levels of threat and three levels of airspace control capability will be used to develop nine airspace control modes. The spaces shown in Figure 1 will be filled with compatible groupings of airspace control procedures.

The author believes that mode procedures can be developed to give commanders useful alternatives for every tactical situation. The main purpose of the three by three arrangement in Figure 1 is to give a label to each mode.

	DECENTRALIZED CONTROL	MIXED CONTROL	CENTRALIZED CONTROL
HEAVY THREAT			
MEDIUM THREAT			
LIGHT THREAT			

LIGHT THREAT

Figure 1. Influences on Airspace Control Modes

The title "Heavy Threat/Decentralized Control Mode" should give an indication of the tactical situation and the means to accomplish airspace control. Threat assessment will be a commander's subjective judgment of the enemy's ability to use air operations. Threat will be classified as Heavy, Medium, or Light to serve as a measure of the airspace restrictions and operational risks a commander is willing to accept. A Heavy Threat would indicate operational risks may be necessary whereas a Light Threat would indicate emphasis on aircraft safety. While the threat levels are subjective, a Heavy Threat may indicate heavy casualties or

aircraft losses from enemy air operations. The real purpose of the use of threat levels will be to relate the desired procedures, or modes, from one commander to another.

The second major influence is the airspace control capability, which will be used to indicate the procedures a commander would employ to meet an enemy air threat. Capability will be classified as Centralized, Mixed, or Decentralized to specify alternative procedures. A Centralized Control capability connotes good radar coverage, reliable communications systems, and sufficient airspace control operators to operate a centralized airspace control system. Decentralized Control indicates a block of airspace will be managed by prearranged or procedural methods which do not require radar coverage or extensive communication. The Centralized airspace control classification is intended to accommodate the doctrinal desires of the Air Force, and the Decentralized airspace control classification is intended to accommodate the doctrinal positions of the Army. The Mixed Control capability indicates a combination of procedures. Mixed Control is a common procedure which permits the Air Force to exercise radar control above a designated altitude and to assign the airspace control below that altitude to the Army for control. The demarcation is called a coordinating altitude, which is a vertical separation in a block of airspace. Airspace control procedures found in current Service manuals will be used to develop the modes. This will be done to

show that existing procedures only need to be managed and coordinated by air and ground commanders.

PROCEDURES IN EACH MODE

To simplify this proposal, only the requirement to coordinate aircraft, air defense weapons, and artillery will be used to illustrate a set of procedures for each mode. Since one purpose of each mode is to give a commander a useful grouping of compatible procedures, current procedures for the control of aircraft, air defense, and artillery will be distributed in each of the modes to give nine identifiable alternatives. Air defense commanders normally indicate the degree of control imposed on firing units by specifying a weapon control status. The three currently used statuses are Free, Tight, and Hold Fire. These are defined as:

Weapons Free: fire at any aircraft not identified as friendly.

Weapons Tight: fire at aircraft positively identified as hostile in accordance with established hostile criteria.

Weapons Hold: do not fire; [however,] the right of self-defense against attacking aircraft is not denied in peace or war.³⁴

A weapon control status indicates the degree of risk to friendly aircraft which is acceptable and is related to the restrictions which will be placed on aircraft operations. A weapon control status is normally specified by the Air Force component commander in his duties as the Air Defense Commander, or by other commanders to control their organic air

defense weapons.

To prevent interference, aircraft should be separated from active air defense systems and from artillery fire either by a physical separation or by coordinated time intervals. In a centralized airspace control system with adequate communications, coordination can be accomplished by timing; however, provisions should be made for means of airspace control when the assets for Centralized Control are not available. This will require separation of conflicting systems, unless risk to friendly aircraft is acceptable.

The procedures to coordinate artillery fire and aircraft operations will be distributed into different modes to accommodate the degree of risk which commanders deem acceptable. In some tactical situations requiring both aircraft operations and artillery in the same block of airspace, some risk may be acceptable. Three levels of artillery coordination will be specified as Free, Advise, and Coordinated. The Free status of artillery fire connotes that aircraft operations should not restrict artillery fire. Artillery would be free to fire through airspace where aircraft may be operating. Naturally, an artillery man would be expected to delay pulling a lanyard if an aircraft were lined up with the barrel of his weapon. Under the Advise status, artillery units would advise aircraft control agencies when artillery fire will be conducted. The responsibility to direct aircraft around artillery fire will rest with the aircraft

control system. The Coordinated status requires that artillery control facilities and aircraft control facilities maintain communications or procedures to permit distance or timed separation. In this case, artillery would not fire without the consent of an aircraft control agency.

By separating currently used procedures into compatible groupings, one possible combination is shown in Figure 2. The means of aircraft, air defense, and artillery control are grouped to respond to different conditions of available assets, operational risks, and the need for a particular weapon system. The Heavy Threat/Decentralized Control mode could be used either when there is no requirement for friendly air operations in a block of airspace or when a severe enemy threat makes a large operational risk acceptable. It must be emphasized that a mode can be used for a block of airspace in other conditions than specified by the title of the mode. For example, the Heavy Threat/Decentralized Control mode may be used when there is no requirement to use an available radar and communication system. Available equipment may simply be in a standby status to protect it from detection and countermeasures by the enemy. Also, if an airspace control system does not have a sufficient number of operators to maintain positive control of a large area, blocks of airspace could be placed in a mode which does not require operator attention.

The mode characteristics presented in Figure 2, were

DECENTRALIZED CONTROL	MIXED CONTROL	CENTRALIZED CONTROL	
Air Defense FREE Aircraft Restricted Artillery FREE	Air Defense FREE except in Corridors Aircraft Restricted to Corridors Artillery FREE except in Corridors	Air Defense TIGHT Aircraft under Positive Control Artillery ADVISE	HEAVY THREAT
Air Defense TIGHT Status Aircraft advised of Minimum Risk Routes Artillery ADVISE Air- craft Control Center	Air Defense TIGHT Jet Aircraft above Coordinating Alti- tude under Cen- tralized Control Helicopters under Coordinating Alti- tude under Decen- tralized Control Artillery ADVISE	Air Defense TIGHT Status Aircraft under Positive Control Artillery ADVISE Air Control Center	MEDIUM THREAT
Air Defense TIGHT Status Aircraft Routes Artillery COORDINATED with Aircraft Control Center	Air Defense TIGHT Jet Aircraft above Coordinating Alti- tude under Central- ized Control Helicopters under Coordinating Alti- tude under Decen- tralized Control Artillery COORDINATED with Aircraft Control Center	Air Defense TIGHT Status Aircraft under Positive Control Artillery COORDINATED with Aircraft Control Center	LIGHT THREAT

Figure 2. Recommended Airspace Control Mode Characteristics

arranged to accommodate current doctrinal disputes which have prevented joint agreement on airspace control. Hopefully, each Service will recognize several modes which are in consonance with some of their present doctrine and procedures. Also, the modes which may clash with a present doctrinal positions may be recognized as useful or necessary in some tactical situations.

APPLICATION OF THE AIRSPACE CONTROL MODES

One purpose of the airspace control modes is to enable air and ground commanders to present their requirements in terms of relevant tactical alternatives that include considerations of threat, risk, and available assets. As participants in a decision process that provides common terminology and a sufficient number of useful alternatives, commanders may make most airspace control decisions in terms their subordinates can understand and execute. It is acknowledged that a brilliant commander can develop an ideal concept for airspace control and plan every procedure in excruciating detail if there is sufficient time. This can be done for preplanned and orderly operations; however, the mode concept would allow understandable concepts to be related by a few words. The modes provide a means of making recommendations, comparing alternatives, and delivering decisions. The requested modes would be sent up a military chain of command for approval or conflict resolution. Approved modes would be sent down the chain of command from

the joint or unified commander as orders to be executed. The participating decision process may be explained by an example. If an air and ground commander in a joint force could not agree within the mode concept, they may make a presentation to the joint commander in this manner:

Ground: My divisions all want Heavy Threat/Decentralized Control in each division area. The few close air support flights we are getting are not worth the casualties we are taking from enemy airstrikes. I want to use my air defense missiles without coordination. We can't get an identification soon enough to fire.

Air: I need half of the division airspace in the Heavy Threat/Centralized Control to get low level interdiction flights out and in. The enemy has been massing air defense weapons on the routes we have been using. I have good radar coverage of the area and can vector my aircraft through safe areas.

Joint: Work out a schedule for half of the division airspace in Heavy Threat/Decentralized Control and half of the division airspace in Heavy Threat/Centralized Control. I want the modes for each division block airspace to change daily in a random pattern. The attacking divisions must be in Heavy Threat/Centralized Control or Medium Threat/Mixed Control to allow close air support.

The above conversation allowed a decision in terms each commander understood. When each division or squadron commander is given the mode schedule for each division sized block of airspace, the operators of aircraft and air defense weapons can be told which rules apply in each area. The modes provide flexible operation without a detailed assignment to each weapon system. Another conversation might be:

Ground: I need close air support in the 20th Division area. They have Heavy Threat/Decentralized Control now but I can get my units in Medium Threat/Centralized Control by 0900. Can you give radar control?

Air: I don't have enough controllers. I'll take the 20th in Medium Threat/Centralized Control if you will put the 52d and 53d Divisions in Heavy Threat/Decentralized Control. I will have all my flights back through those areas by 0900.

Ground: Agreed. We will be requesting close air support for the 20th at 0900.

Figure 3 illustrates how airspace control modes may be assigned to division sized blocks of airspace. Radar control procedures can be used in the center division area, while air defense weapons are free to fire at any aircraft not identified as friendly in the left division area and outside a corridor in the right division area. This situation is tailored for defense against enemy airstrikes. By changing the mode in each division area in a random pattern, the massed air defense capabilities would not be predictable by the enemy. The modes become analogous to a professional football team playbook, where useful combinations are defined, practiced, and the effectiveness of different procedures can be predicted.

While the Heavy Threat scenarios may sound drastic, a purpose of airspace control modes is to provide simple, workable procedures that do not depend on the ideally structured procedures that are typically practiced in peacetime. Unless disastrous situations are considered, useful alternatives to respond to equipment losses or communication losses might not be practiced or understood by airspace control operators. The vulnerability of an airspace control system to enemy countermeasures or direct tactical action

should be considered. In some situations, the employment of the primary airspace control equipment may simply not be appropriate. A mode concept should promote training in viable backup procedures.

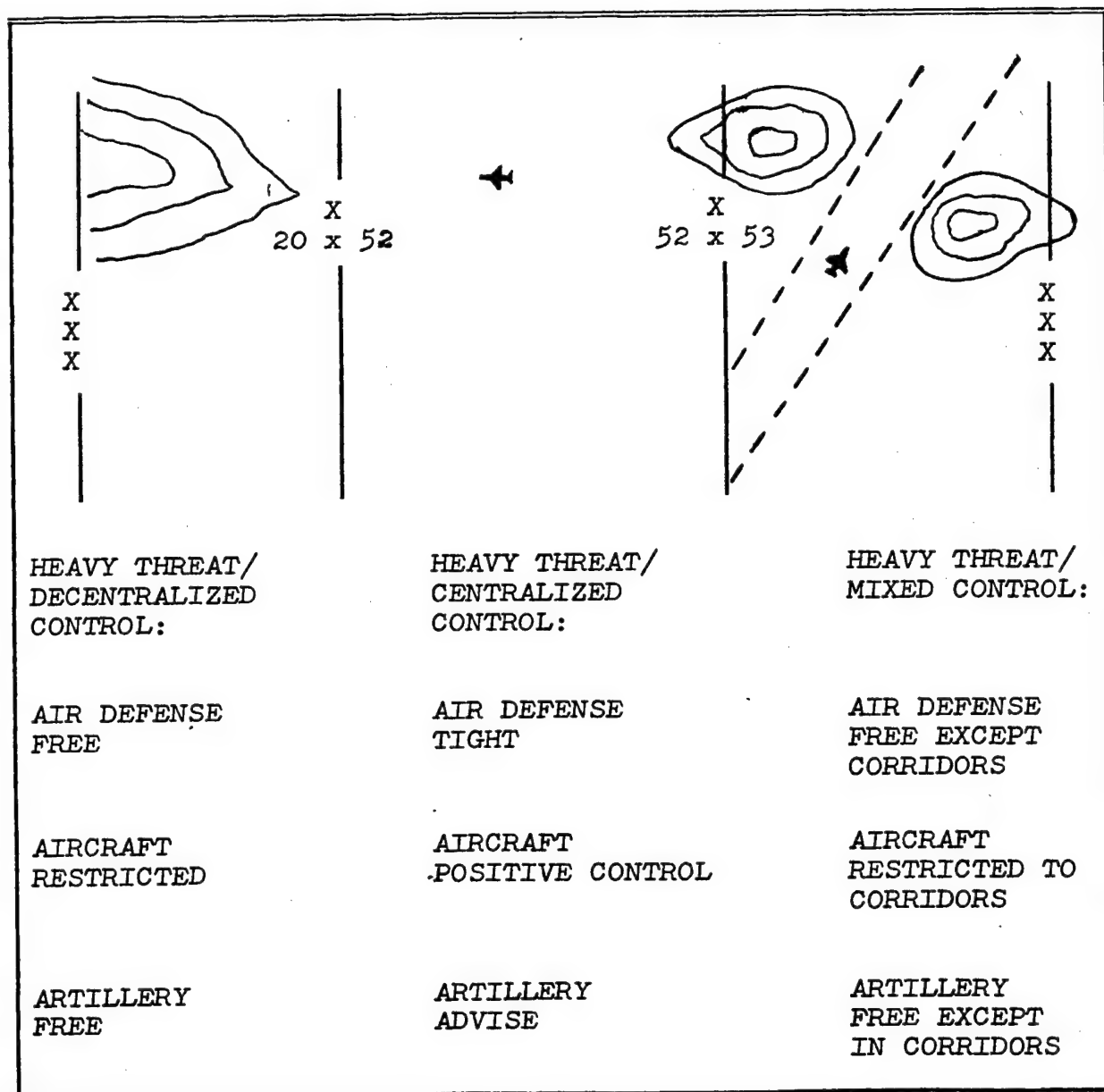


Figure 3. Sample assignment of airspace control modes to division sized blocks of airspace.

ADVANTAGES AND DISADVANTAGES

The primary advantages of the multimode airspace control concept were presented in this chapter. They included optimizing weapon systems in separate blocks of airspace to meet a threat, enabling air and ground commanders to choose alternative procedures for airspace control, and confusing the enemy by employing different procedures in different sectors of the battlefield. If accepted in joint doctrinal manuals, the mode concept will provide training objectives and alternatives to stereotyped airspace control procedures which are predictable by an enemy.

The primary disadvantages are that the modes restrict some of the airspace users and produce an additional training requirement. Restrictions are necessary to prevent interference between conflicting airspace users, unless one of the Centralized Control modes can be used for positive coordination. If communications are not available to permit integration of aircraft, air defense weapons, and artillery fire in one block of airspace, a restrictive mode of airspace control must be selected. Communicating the current and planned modes of airspace control will be a problem; however, any airspace control system will have the same problem if detailed instructions must be sent to each airspace user. Another disadvantage is the increased training which would be required to implement the airspace control modes. The additional training would be required primarily for commanders in

the airspace control decision process, since operators will be using current procedures.

CHAPTER IV

TEST OF THE HYPOTHESIS

HYPOTHESIS

The background investigation of this study disclosed that the Services cannot agree on a joint airspace control doctrine primarily because some Services dispute the level of command which would exercise airspace control, and because some Services state a requirement for control of a permanent block of airspace to insure freedom to employ their weapons. Airspace control should only be a problem when conflicting weapon systems are required to be employed in the same airspace or airspace is hoarded to the disadvantage of one airspace user. To circumvent the problems which have deadlocked negotiations, a participative multimode concept was developed in this study. The concept used current airspace control procedures arranged in alternative compatible groups. If air and ground commanders cooperate in a decision process, within the mode concept, they should be able to agree on useful procedures or submit the problem in relevant terms to a higher commander for decision.

If a joint airspace doctrinal manual acknowledges that different modes of airspace control actually exist and that different means of controlling airspace should be

developed, any dogmatic doctrinal positions which have prevented cooperation should be circumvented. It is expected that officers with knowledge of airspace control procedures will agree that modes of airspace control should be used in joint airspace control doctrinal manuals.

The hypothesis is that after selected officers at Fort Leavenworth are briefed on the background of the Service divergent issues on airspace control and after they have been presented a concept for multimode joint airspace control, they will find the concept suitable for joint Service doctrine and will recommend that more than one mode be used in joint Service airspace control doctrine.

TEST PLAN

To test the hypothesis that selected officers with knowledge of airspace control procedures will find the multimode concept suitable for joint doctrine, the contents of Chapters I through III were presented to two test populations. The U.S. Army Command and General Staff College students enrolled in a course titled R680 Airspace Control Professional Elective were selected as one group. The students in the Airspace Control Professional Elective were mostly pilots and air defense officers who voluntarily enrolled in the course to further their knowledge of airspace control. These 29 officers met in three different sections. The author was a member of one section of twelve officers. A second test

population included the Research Advisor and three members of the Graduate Research Faculty assigned to this study. These four officers, each from a different Service, are instructors at the Army Command and General Staff College and were requested to select officers from the faculty to participate in the test. The second population also included Lieutenant Colonel C. E. Herlocker, Chief, Air Defense System Branch, Combined Arms Combat Developments Activity (CACDA) at Fort Leavenworth. He was requested to select officers with backgrounds in airspace control and air defense from the CACDA staff.

An eighteen minute video tape was prepared by the author to summarize the contents of Chapters I through III. The outlined contents of the video tape are shown in Appendix A. The video tape and the questionnaire shown in Figure 4 was presented to the test populations to perform the test.

THE RESULTS OF THE TEST

The response from all officers who volunteered to participate in the test are tabulated in Tables 1 and 2. Of the first group, 26 of the 28 students, excluding the author, and two instructors participated. Twenty questionnaires were returned from the second group, which included twelve Army, three Navy, four Marine Corps, and two Air Force officers. The test results indicated that the multi-mode concept, as presented, was generally accepted by the

QUESTIONNAIRE

Your assistance is requested for a student research report. All answers will be nonattributable and used only for totals in the chart below.

The Services have not been able to agree on a Joint Airspace Control Doctrine. Believing that proposed airspace control doctrines are either too general to have useful procedures or too specific to cover a wide range of operational risks and tactics, Major Johnson proposes a Multimode concept. In the same sense that terms such as pursuit, exploitation, coordinated attack, and defensive operations connote different employment of assets, airspace control should have descriptive modes of operation. These modes, or logical groupings of aircraft, air defense, and artillery employment, would be responsive to three levels of air threat (heavy, medium, and light) and three levels of control capability (centralized, mixed, and decentralized). The nine modes provide operators and commanders common terminology and thought processes for requests and decisions when there is no time for detailed operation orders. Instead of a homogeneous airspace control system, the modes allow optimized employment of complimentary weapons in different sectors of the battle area. The concept is claimed to satisfy the Joint Chiefs of Staff's guidance in JCS Memorandum 2308/299-2, the doctrines of the four Services and pragmatic tactical requirements.

Using your professional judgment and opinion, please answer the questions concerning the concept of Multimode Airspace Control Doctrine.

IS THE MULTIMODE AIRSPACE
CONTROL CONCEPT SUITABLE FOR:

(ANSWER YES OR NO IN ONE COLUMN
CORRESPONDING TO YOUR SERVICE)

JOINT SERVICE DOCTRINE?
(Joint Publication)

AIRSPACE CONTROL DOCTRINE FOR
YOUR SERVICE?

UNIT TRAINING PROCEDURES FOR
YOUR SERVICE?

ACADEMIC STUDY?

WHAT NUMBER OF MODES DO YOU
THINK THERE SHOULD BE IN JOINT
AIRSPACE CONTROL DOCTRINE?
(Answer with number)

OPTIONAL COMMENTS:

ARMY	NAVY	MARINE CORPS	AIR FORCE

Figure 4. Questionnaire Used for the Test.

IS THE MULTIMODE AIRSPACE
CONTROL CONCEPT SUITABLE FOR:

SERVICE OF TEST POPULATION

		ARMY	NAVY	MARINE CORPS	AIR FORCE
JOINT SERVICE DOCTRINE?	YES	19			6
	NO	1			0
	OTHER				2
AIRSPACE CONTROL DOCTRINE FOR YOUR SERVICE?	YES	20			5
	NO	0			1
	OTHER	0			2
UNIT TRAINING PROCEDURES FOR YOUR SERVICE?	YES	19			5
	NO	1			1
	OTHER	0			2
ACADEMIC STUDY?	YES	20			7
	NO	0			
	OTHER	0			
WHAT NUMBER OF MODES DO YOU THINK THERE SHOULD BE IN JOINT AIRSPACE CONTROL DOCTRINE?	ONE				
	TWO				
	THREE	1			
	FOUR	2			1
	FIVE	2			1
	SIX				
	SEVEN				
	EIGHT				
	NINE	7			2
	MORE THAN NINE	5			1
	OTHER	3			3

* OTHER INCLUDES ALL OTHER RESPONSES SUCH AS QUESTION MARKS,
BLANK SPACES AND QUALIFIED ANSWERS.

Table 1. Tabulation of Test Results from the Officers in the
R680 Airspace Control Professional Elective.

IS THE MULTIMODE AIRSPACE
CONTROL CONCEPT SUITABLE FOR:

SERVICE OF TEST POPULATION

		ARMY	NAVY	MARINE CORPS	AIR FORCE
JOINT SERVICE DOCTRINE?	YES	2	2	4	1
	NO	7	1		
	OTHER	3			1
AIRSPACE CONTROL DOCTRINE FOR YOUR SERVICE?	YES	3	1	4	1
	NO	6	2		
	OTHER	3			1
UNIT TRAINING PROCEDURES FOR YOUR SERVICE?	YES	5	2	4	1
	NO	4	1		
	OTHER	3			1
ACADEMIC STUDY?	YES	9	3	4	1
	NO	1			
	OTHER	2			1
WHAT NUMBER OF MODES DO YOU THINK THERE SHOULD BE IN JOINT AIRSPACE CONTROL DOCTRINE?	ONE				
	TWO				
	THREE	3	1		
	FOUR				1
	FIVE				
	SIX	2	1	2	
	SEVEN	1			
	EIGHT				
	NINE		1	1	
	MORE THAN NINE	1			
	OTHER	5		1	1

* OTHER INCLUDES ALL OTHER RESPONSES SUCH AS QUESTION MARKS,
BLANK SPACES AND QUALIFIED ANSWERS.

Table 2. Tabulation of Test Results from Selected Officers
from the U.S. Army Command and General Staff
College Faculty and the Combined Arms Combat
Developments Activity.

student group and was rejected by instructors and CACDA staff members.

From the R680 Airspace Control Professional elective, 95 percent of the Army officers in the first group said the multimode concept was suitable for joint airspace control doctrine. This is contrasted with the results from the Army instructors and CACDA staff officers where only 42 percent accepted the concept. Seventy-five percent of the Air Force students who participated in the test favored the multimode concept. None of the officers from either group said that only one or two modes should be used, and 73 percent recommended three or more modes. Since the multimode concept was not accepted by the selected Army officers on the U.S. Army Command and General Staff College Faculty and the Army officers on the CACDA staff, the first part of the hypothesis is not supported. The second part of the hypothesis that the selected officers will recommend that more than one mode should be used in joint airspace control doctrine is supported.

ANALYSIS OF THE TESTS

The optional comments which were recorded at the bottom of the questionnaire in Figure 4 give an indication of the reasons for the test results. The negative responses to the first question were associated with comments such as:

Too complicated. The air threat would be too fluid to classify as to what it would be.

The overall concept has merit. This concept requires refinement.

Air Force will never buy Weapons Free in a heavy threat condition.

The method of defining the threat level is not appropriate to the Army. I don't believe the Army has the capability to achieve centralized control.

Do not include in doctrine until war gamed and studied by schools, centers, etc.

Basically, the multimode concept, as presented, would not be accepted without further development. The respondents related their own specialized demands of an airspace control system and would not accept a concept that would not give specific assurances that it would solve some of their problems. Most aviators had suggestions to improve safety, the air defense officers wanted more freedom to engage enemy aircraft, and infantry officers demanded the prerogative of selecting supporting arms without mode constraints. Each officer correctly discussed his tactical requirements and proposed that "other" systems should be coordinated to reduce interference.

The affirmative answers were mainly from officers in the R680 Airspace Control Professional Elective who had struggled to understand and to develop airspace control procedures. Recognizing the conflicts between the airspace control manuals of the Services, several students verbally confided, "anything is better than what we have now." Even the affirmative answers to the first question on Figure 4 had pragmatic comments such as:

I agree wholly that a system such as this is needed; however, I have reservations that it would ever be acceptable to the political sides of our Services.

With a matrix of nine, finding common agreement among commanders is extremely difficult. The basic decision remains unchanged, but the choices are now common to all.

Of the 48 returned questionnaires, only one stated the multimode concept was not suitable for academic study. The one objector to the question believed the concept required refinement and stated: "[I] believe 6-8 modes can be worked out which will allow complete flexibility."

Of the 48 returned questionnaires, five responses said there should be three modes of airspace control, and all others recommended more than three modes or did not answer the question. The 35 answers that stated a specific number of modes indicated that the officers envisioned different modes from those presented.

Due to the small size of the test populations, statistical inferences would not be reliable. The only inferences that can be drawn from the test is that the students who participated, primarily air defenders and aviators, want a multimode joint airspace control doctrine while other Army officers, whose combat support depends on the airspace control doctrine, are reluctant to accept a concept that does not give assurances in detail.

SUMMARY OF THE TEST

The development of the multimode concept, as presented

in this study, was an attempt to convince selected officers that pragmatic tactical considerations could override some of the divergent doctrinal positions of the Services on airspace control. Instead of appealing for Service cooperation to modify established doctrinal positions, the applicability of present doctrinal positions to different tactical situations was stressed. The groupings of procedures, or modes, should have provided alternative courses of action for command decision processes and training objectives. The concept, as presented, was to demonstrate that the airspace control procedures advocated by each Service were applicable to different tactical situations.

The favorable response from the students in the Airspace Control Professional Elective was perhaps due to the fact that they were preconditioned to try to solve a problem known to them. They were aware of the contradictions in current airspace control Service manuals and were seeking a solution to the divergent issues between the Services.

The U.S. Army Command and General Staff College instructors and the Combined Arms Combat Developments Activity officers selected for the test stated further development of the multimode concept should be attempted. The content of the eighteen minute video tape was not deemed sufficient evidence to justify their endorsement of a joint doctrinal concept. In the author's opinion, thoroughly developed war-gamed scenarios would have been a more

appropriate vehicle for the test than a short briefing. In a minor way, this test of the multimode proposal parallels the endeavors of the Air Force to draft a manual based on general principles and guidance applicable to every tactical situation. The reviewers of this test would not accept a general concept, but required specific details pertinent to their Service.

CHAPTER V

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

In 1965, the Joint Chiefs of Staff identified the joint Service conflicts in airspace control and recognized the requirement of each airspace user to have airspace freedom for tactical operations. Airspace control was then defined by the Joint Chiefs of Staff as a service to coordinate, integrate, and regulate airspace users, with the authority to approve or deny air operations given only to the joint force commander. In agreeing to a broad concept that recognized the requirements of Service systems, but placed the authority for approval or denial of air operations above a Service component commander, the Joint Chiefs of Staff selected an accommodating solution that would depend on Service cooperation and coordination in application.

The Air Force was tasked, in coordination with the other Services, to develop a joint airspace control doctrine. In the draft manuals, the Air Force attempted to establish the Air Force component commander as an Airspace Control Authority who would operate an integrated airspace control and air defense system. Recognizing the centralized

operational control the Air Force Component Commander already exercises as the Air Defense Commander, the other Services were concerned that a similar system for airspace control could operationally control all aviation, missile, and artillery assets of other Services in the name of an airspace control service. While the Air Force stressed centralized control of all airspace for flexibility and efficiency in joint operations, the other Services stated specific requirements for control of their own block of airspace over the combat area in order to employ organic aviation or artillery. The major divergent issues became disagreement over the level of command which would exercise airspace control and the requirement for ground commanders to habitually control a block of airspace over the battlefield. Each Service maintained it possessed an airspace control system which could coordinate with the Air Force system, instead of being delegated a subordinate role in a centralized system.

The same doctrinal airspace control issues are evident as the Army and the Air Force are attempting to develop a two-Service manual for joint airspace management. It is unlikely that a four-Service joint manual or a JCS Publication on airspace control doctrine will be developed until after the same issues are resolved by these two Services.

In the review of related literature, a common recommendation made by researchers who proposed a solution

to the joint airspace control doctrinal problem was to urge Service cooperation. Many recommendations urged the formation of a truly joint airspace management system to remove the parochial influence of one Service and encourage participative cooperation.

The part of the hypothesis, in this study, that selected officers at Fort Leavenworth would find a concept for multimode joint airspace control, as developed and presented in this study, suitable for joint doctrine was not supported. While the concept was accepted by students enrolled in the R680 Airspace Control Professional Elective at the U.S. Army Command and General Staff College, the selected College instructors and officers from the Combined Arms Combat Developments Activity demanded further development of the details of the concept.

The part of the hypothesis, in this study, that selected officers at Fort Leavenworth would agree that more than one airspace control mode should be included in joint doctrine, was supported: Of the 48 officers who participated in the test, 35 recommended three or more modes, and thirteen did not answer the question on the questionnaire.

RECOMMENDATIONS

It is recommended that joint doctrinal manuals include a multimode concept for airspace control to guide training in order to accommodate alternative airspace control

requirements. In addition to providing broad guidance to cover all possible situations, joint airspace control doctrinal manuals should recognize different procedures predicated on the enemy threat and available airspace control equipment.

It is additionally recommended that further study should be initiated to develop useful joint airspace control modes of operation. Each mode of airspace control should be derived from a war game process of a battlefield scenario. The scenarios should include tactical situations that consider a full range of enemy air threat, acceptable operational risks, and degradation of communication and radar equipment.

ENDNOTES

ENDNOTES

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⁴Department of Defense Dictionary of Military and Associated Terms, JCS Publication 1, Washington, D.C., 2 January 1972, p. 101.

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⁶Robert I. Stoverink, then Lieutenant Colonel, USA, "Proposed JCS Publication-Doctrine and Procedures for Airspace Control in the Combat Area," an unpublished information brief for the Army Chief of Staff, 20 July 1971, p. 1.

⁷TAC Doctrinal Positions, Headquarters, Tactical Air Command, 15 April 1973, p. 3. (FOUO)

⁸"Doctrine and Procedures for Airspace Control in the Combat Area," Department of the Air Force letter file XODD dated 26 April 1971, p. 1.

⁹Sautter, op. cit., p. 22 citing JCS 2308/299-2.

¹⁰"Joint Doctrine for Airspace Control over the Combat Area," Department of the Air Force letter AFXPDJ, 25 March 1968.

¹¹Stoverink, op. cit., p. 2.

¹²"Joint Doctrine and Procedures for Airspace Control in the Combat Area," Department of the Air Force, letter file XXOD, 26 April 1971, Inclosure p. 6.

¹³"Joint Doctrine and Procedures for Airspace Control in the Combat Area," Department of the Army, letter file DC DI, 7 September 1971, Inclosure p. 4.

¹⁴Ibid., p. 5.

¹⁵TAC Doctrinal Positions, Headquarters, Tactical Air Command, 15 April 1973, p. 3. (FOUO)

¹⁶"Joint Doctrine and Procedures for Airspace Control in the Combat Area," Department of the Army, letter file FOR DC DI, 7 September 1971, p. 1.

¹⁷"Joint Doctrine and Procedures for Airspace Control over the Combat Area," Department of the Navy, letter file Op-60/cr, Ser 372P60, 2 August 1971, Enclosure p. 2.

¹⁸Ibid., p. 3.

¹⁹"Doctrine and Procedures for Airspace Control in the Combat Area," Headquarters, U.S. Marine Corps, letter file ATA-lri-19, 28 June 1971, Enclosure p. 2.

²⁰Ibid., p. 4.

²¹TAC Doctrinal Positions, Headquarters, Tactical Air Command, 15 April 1973, p. 3. (FOUO)

²²"TAC-TRADOC Joint Working Groups," U.S. Army Training and Doctrine Command, letter file ATCD-J, 18 December 1973.

²³Maxwell D. Taylor, General (Retired), The Uncertain Trumpet (New York: Harper and Brothers, 1959), p. 168.

²⁴Unified Action Armed Forces, JCS Publication 2, Washington, D.C., 23 November 1959, p.45. (FOUO)

²⁵Joseph T. Hicks, Lieutenant Colonel, "Airspace Coordination-A Flaw in Army Operations," Air Defense Trends, U.S. Army Air Defense School, Fort Bliss, Texas, March 1972, pp. 31-33.

²⁶"Navy/Marine Corps Position for Control of Tactical Air Operations in Support of Joint Operations," Department of the Navy, unpublished position paper, 24 October 1972, p. 1.

²⁷"Functions of the Armed Forces and the Joint Chiefs of Staff," Department of Defense Directive 5100.1, 31 December 1958, ammended 17 June 1966.

²⁸Melvin H. Sautter, Lieutenant Colonel, USMC, "Principles for the Control of Air Support Assets Over Joint Land Combat Operations," a Research Report submitted to the Faculty, Air War College, Air University, Maxwell AFB, Alabama, April 1972.

²⁹Robert I. Stoverink, Colonel USA, and others. "Control of Airspace in the Combat Area," a Research Report submitted to the Faculty, Air War College, Air University, Maxwell AFB, Alabama, April 1973. Also, Jim Fults, Lieutenant Colonel, USAF, and others, "Joint Air and Airspace Coordination System: A Conceptual Study," a Research Report submitted to the Faculty, Air War College, Air University, Maxwell AFB, Alabama, April 1973.

³⁰Sautter, op. cit., p. 53.

³¹Ibid., p. 24.

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³³Fults, op. cit., p. 47.

³⁴U.S. Army Air Defense Artillery Employment, FM 44-1, Department of the Army, February 1970, p. 10-6.

APPENDIX

APPENDIX A

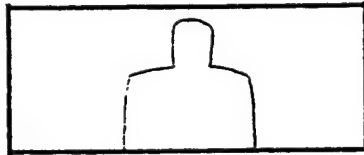
VIDEO TAPE PRESENTATION USED FOR THE TEST

An eighteen minute videotape was prepared by the author at the U.S. Army Command and General Staff College Instructional Television Facility. This video tape summarized the contents of Chapters I through III of this study. The following script presents the television views and an outline of key points of the narration:

SCENE 1

A Proposal for
Multimode
Airspace Control

SCENE 2



JCS tasked the Air Force in 1965 to develop joint airspace control doctrine.

Six Air Force draft manuals were rejected by other Services.

There is no joint airspace control doctrine.

Propose solution called Multimode airspace control to viewers.

Ask viewers if concept suitable for joint airspace control doctrine.

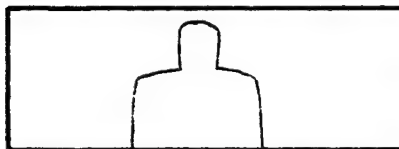
Ask viewers if the right number of modes are used.

SCENE 3

Aircraft (A/C)
Air Defense (ADA)
Artillery (ARTY)

Define primary users of airspace.
State conflicts between airspace users.
State requirement for control.

SCENE 4



Historically, each Service had optimized airspace control doctrine.

Each Service doctrine is specialized for Service assets.

Meshing assets of each Service in joint operations is a problem.

Problem was considered by JCS in 1965.

The Joint Chiefs of Staff did make a decision in 1965.

SCENE 5

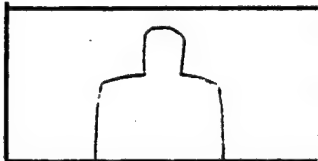
JCS DECISION-MAY 65
Definition
Service Systems
Preclude Interference
Requirements
Assignment of Block Airspace
Authority
Maximum Freedom

JCS reviewed seven alternative proposals.

One of the seven alternatives was selected for airspace control outside of an amphibious objective area.

Discuss main points of JCS decision on airspace control.

SCENE 6



JCS decision became a "Constitution" with "rights" for each Service.

Each Air Force proposal was rejected because of Service "rights" to employ organic weapon systems.

SCENE 7

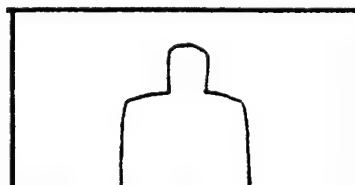
REQUIREMENTS:

JCS Guidance
Service Doctrine
Tactics

Discuss requirements to be satisfied by a solution to the airspace control issues.

Definition of doctrine: fundamental principles which guide actions.

SCENE 8



This proposal will emphasize tactical solutions instead of political solutions.

One airspace control influence is the enemy threat.

SCENE 9

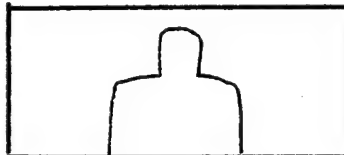
THREAT:

Heavy
Medium
Light

Define Heavy, Medium, and Light threat.

Discuss influences of threat on aircraft, air defense, and artillery.

SCENE 10



A second airspace control influence is the capability to control.

Capability is determined by available airspace control equipment, personnel and tactically acceptable procedures.

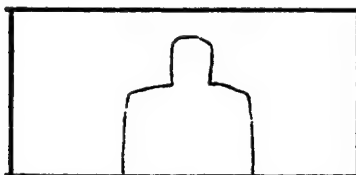
SCENE 11

AIR CONTROL CAPABILITY:

Centralized
Mixed
Decentralized

Define Centralized, Mixed, and Decentralized control.

SCENE 12



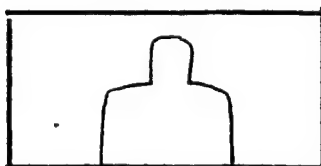
Arrange three threats and three control capabilities in nine modes for different airspace control procedures.

SCENE 13

HEAVY THREAT		
HD	HM	HC
MD	MM	MC
LD	LM	LC
LIGHT THREAT		

Mode titles should form mental images of situation and capabilities to be used.

SCENE 14



Modes serve similar function as football team play-book.

Modes become grouping of procedures to be planned, practiced and used with expected results.

SCENE 15

ADA FREE A/C RESTRICTED	ADA FREE EXCEPT CORRIDORS	A/C POSITIVE CONTROL ADA TIGHT
ADA TIGHT A/C ROUTES ARTY ADVISE	JETS HIGH COORDINATING ALTITUDE HELO. LOW	POSITIVE CONTROL ARTY DEVISE
A/C ROUTES ARTY COORDINATED	JETS HIGH ARTY COORDINATED HELO. LOW	POSITIVE CONTROL A/C AND ARTY

Discuss mode characteristics.

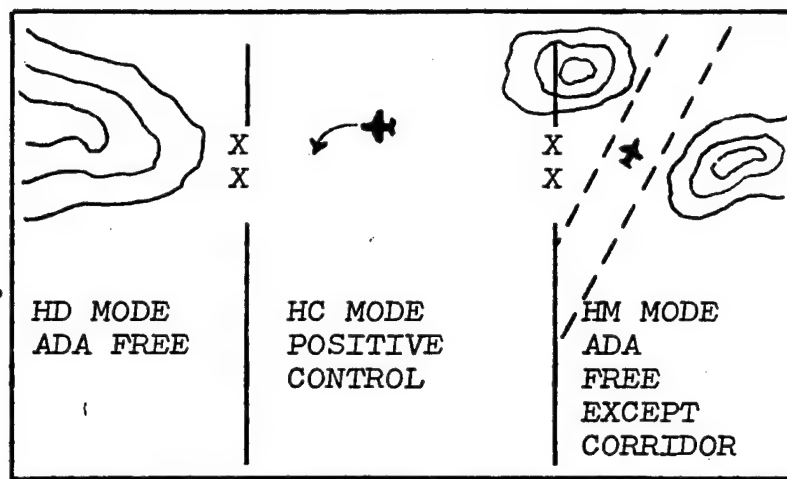
Discuss use of modes in different tactical situations.

SCENE 16



One purpose of modes is to give commanders choices of airspace control procedures.

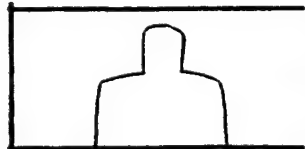
SCENE 17



Explain sample situation for division sized blocks of airspace.

Stress granular blocks of airspace to confuse the enemy and optimize weapon systems.

SCENE 18



Use modes to make requests to senior commanders.

Decisions are made in terms operators can understand.

Multimode concept optimizes different weapons in different blocks of airspace.

SCENE 19

DISADVANTAGES

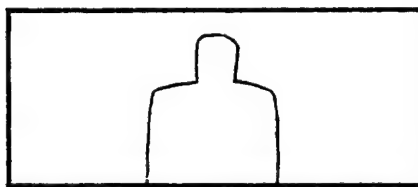
Restricts Some Assets
Increased Training

ADVANTAGES

Optimized for Threat
Choices for Commander
Confuse Enemy

Discuss disadvantages and advantages.

SCENE 20



Recommend Multimode Concept for joint airspace control doctrine.

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